

Problem F: Unbirthday Presents

After her time with the White Queen, Alice met Humpty Dumpty, a big egg-shaped old chap who is very knowledgeable of words and their meanings. Alice complimented him on the pretty cravat he had on his neck –although at first she confused it with a belt because, in Alice’s defense, it is hard to tell apart Humpty Dumpty’s neck from his waist– and he explained that it was an un-birthday present from the White King and Queen.



Figure 1: Humpty Dumpty greets Alice

The White King and Queen are very generous and they enjoy giving unbirthday presents to their friends. From time to time they decide to buy gifts in the following way: the King chooses a positive amount of money \mathbf{K} , and the Queen chooses a positive amount of money \mathbf{Q} . Then they decide to buy the maximum possible amount of gifts, spending all their allotted money and each of them spending equal portions of their shares for all the gifts.

For example, if the King chooses $K = 6$ and the Queen chooses $Q = 4$ then they can buy a maximum of 2 gifts, and in that case the King would spend 3 pounds per gift, and the Queen would spend 2 pounds per gift. However, if they would choose $K = 5$ and $Q = 3$ then the maximum number of gifts they would buy would be 1.

Let’s say that the King never spends less money than the Queen on gifts, and that there is a limit \mathbf{P} on the amount of money each of them can set aside for unbirthday gifts.

Being very unselfish monarchs, the King and Queen want to choose amounts of money that that would result in them buying more than one gift. How many different valid combinations (K, Q) are there that would make them buy only one gift?

Input

Input starts with a positive integer \mathbf{T} , that denotes the number of test cases ($T \leq 100000$).

Each test case consists a single integer \mathbf{P} on its own line.

$$1 \leq P \leq 10^7$$

Output

For each test case, print the case number, and then the number of different pairs (K, Q) with $1 \leq Q \leq K \leq P$ such that the King and Queen would only buy one gift with that money.

Print the result modulo 2^{32} .

Sample Input

3
3
5
8

Output for Sample Input

Case 1: 4
Case 2: 10
Case 3: 22

Note

The test data is large. Make sure to use fast I/O methods.